Chapter 1, Section I

1. 22,938  Twenty-two thousand, nine hundred thirty-eight

7. 183,622

10. $b$ 102,470

15. 1,760

Chapter 1, Section II

1. $\begin{array}{c} 27 \\ + 19 \\ \hline 91 \end{array}$

8. $\begin{array}{c} 288 \quad 300 \\ 512 \quad 500 \\ 3,950 \quad 4,000 \\ +1,944 \quad +2,000 \\ \hline 6,694 \quad 6,800 \end{array}$ Rounded Estimate 6,800

Exact Answer 6,694

16. $\begin{array}{c} 354 \\ - 48 \\ \hline 306 \end{array}$

Chapter 1, Section III

1. $\begin{array}{c} 589 \\ \times 19 \\ \hline 11,191 \end{array}$

9. $\begin{array}{c} 202 \quad 200 \\ \times 490 \quad \times 500 \\ \hline 98,980 \quad 100,000 \end{array}$ Rounded Estimate 100,000

Exact Answer 98,980
Chapter 1, Section III (Continued)

17. \[128 \text{ R } 20\]

\[
\begin{array}{c}
35 \left| \begin{array}{c}
4500 \\
35 \\
100 \\
70 \\
300 \\
280 \\
20
\end{array} \right.
\end{array}
\]

Estimate

21. \(890 \div 295\) \(
\begin{array}{c}
900 \\
300
\end{array}
\)

Rounded Estimate 3

Exact Answer 3 R 5
Chapter 2, Section I

1. \(23\frac{4}{5}\) \text{ Mixed} \quad \text{Twenty-three and four-fifths}

6. \(\frac{26}{8} = \frac{3\frac{2}{8}}{8} = \frac{3\frac{1}{4}}{4}\)

12. \(6\frac{1}{2} = \frac{13}{2}\) \quad (6 \times 2 + 1 = 13)

18. \(\frac{21}{35} \div 7 = \frac{3}{5}\)

30. \(\frac{2}{3}\) to twenty-sevenths \(\frac{2}{3} = \frac{\frac{18}{27}}{27} \quad (27 \div 3 = 9 \quad 9 \times 2 = 18)\)

Chapter 2, Section II

1. \(\frac{4}{5}, \frac{2}{3}, \frac{8}{15}\) \quad 3 \times 5 = 15 LCD

\[
\begin{array}{c}
\text{4} \\
\text{3} \\
\text{15} \\
\hline
\text{5} \\
\text{5} \\
\text{1} \\
\text{1} \\
\end{array}
\]

7. \(\frac{5}{6} + \frac{1}{2}\)

\[
\begin{array}{c}
\text{5} \\
\text{6} \\
\text{+} \\
\text{3} \\
\text{6} \\
\hline
\text{8} \\
\text{6} \\
\hline
\text{1} \frac{2}{6} = 1 \frac{1}{3}
\end{array}
\]

21. \(\frac{5}{6} - \frac{1}{6} = \frac{4}{6} = \frac{2}{3}\)
Contemporary Mathematics for Business and Consumers, 7e
Solutions to Jump Start Section Review Exercises

Chapter 2, Section III

1. \[ \frac{2}{3} \times \frac{4}{5} = \frac{8}{15} \]

19. \[ \frac{5}{6} \div \frac{3}{8} = \frac{4}{3} \times \frac{5}{6} = \frac{20}{18} = \frac{10}{9} \]
Chapter 3, Section I

1. .21  Twenty-one hundredths

11. Eight tenths  .8

17. .448557 to hundredths  0.448557 = 0.45

Chapter 3, Section II

1. 2.03 + 56.003

\[
\begin{array}{c}
  2.030 \\
+ 56.003 \\
\hline
  58.033 \\
\end{array}
\]

20. 45.77

\[
\begin{array}{c}
  \times 12 \\
\hline
  549.24 \\
\end{array}
\]

28. 24.6 ÷ 19  1.294 = 1.29

Chapter 3, Section III

1. .125

\[
\begin{array}{c}
  125 \\
\hline
1,000 \\
\end{array}
\]

= \frac{1}{8}

6. \frac{9}{16}  .5625 = .56
Chapter 4, Section I

1. Check # 2550, September 14, 20xx, in the amount of $345.54 to the silky Soap Company for 300 gallons of liquid soap.
Chapter 5, Section I

1. \[ B + 11 = 24 \quad B = 13 \]

18. 
\[ \frac{5 \text{ times } G \text{ divided by } R}{5G \div R} \]

26. A number increased by 24 is 35 
\[ X + 24 = 35 \]

Chapter 5, Section II

1. Karen = \( X \)
Kathy = \( X - 8 \)

\[ X + X - 8 = 86 \]
\[ 2X - 8 = 86 \]
\[ + 8 \quad +8 \]
\[ 2X = 94 \]
\[ \frac{2X}{2} = \frac{94}{2} \]
\[ X = 47 \] Karen's sales
\[ X - 8 = 47 - 8 = 39 \] Kathy's sales
Chapter 6, Section I

1. 28% \( \frac{28}{100} \) 

11. 3.5 \( \frac{350}{100} \% \) 

21. 5% \( \frac{5}{100} = \frac{1}{20} \) 

31. \( \frac{3}{4} = .75 = 75\% \) 

Chapter 6, Section II

1. 15% of 380 is \( \frac{15\times 380}{100} = 57 \) 

11. 40 is \( \frac{40}{125} = .32 = 32\% \) of 125 

21. 69 is 15% of \( \frac{69}{.15} = 460 \) 

Chapter 6, Section III

1. Portion = Increase = 440 – 320 = 120 

Base = Original number = 320 

\( R = \frac{P}{B} = \frac{120}{320} = .375 = 37.5\% \) 

5. 50 increased by 20% = \( \frac{50 + 50(0.20)}{1} = 60 \)
Chapter 7, Section I

1. Box

5. Gross

9. Seller Panorama Products

10. Invoice number R-7431

Chapter 7, Section II

1. Trade discount = 860.00 × .30 = $258.00

6. Trade Discount = 286.00 × .25 = $71.50
   Net Price 286.00 − 71.50 = $214.50

10. Net Price Factor = 100% − 37% = 63%
    Net Price = $3,499.00 × .63 = $2,204.37

14. Trade Discount = $4,500.00 − 3,565.00 = $935.00
    Trade Discount Rate = \frac{935.00}{4,500.00} = .2077 = 20.8%

Chapter 7, Section III

1. Net Price Factor = 100% − 12% = .88
   100% − 10% = .90
   .88 × .90 = .792
   Net Price = 360.00 × .792 = $285.12

7. Net price factor = .85 × .90 = .765
   Single equivalent discount = 1 − .765 = .235

12. Net Price Factor = .85 × .95 × .95 = .76713
    Single Equivalent Discount = 1.00 − .76713 = .23287
    Trade Discount = $7,800.00 × .23287 = $1,816.39
    Net Price = $7,800.00 × .76713 = $5,983.61
Chapter 7, Section IV

1. Cash Discount = $15,800.00 × .03 = $474.00
   NAD = $15,800.00 − $474.00 = $15,326.00

6. Credit for partial payment = $2,500 / .98 = $2,551.02
   NAD = $8,303.00 − $2,551.02 = $5,751.98

10. Discount date = Nov. 4 + 10 = Nov. 14
    Net Date = Nov. 14
    45 − 26 = 19 Dec. 19

15. Discount Date = Dec. 4 + 10 = Jan. 10
    Net Date = Jan. 30
Chapter 8, Section I

1. \[ M = SP - C = 299.95 - 161.50 = 138.45 \]
   \[ \%MC = \frac{M}{C} = \frac{138.45}{161.50} = .8572 = 85.7\% \]

6. \[ SP = C + M = 46.25 + 50.00 = 96.25 \]
   \[ \%MC = \frac{M}{C} = \frac{50.00}{46.25} = 1.081 = 108.1\% \]

Chapter 8, Section II

1. \[ SP = C + M = 65.00 + 50.00 = 115.00 \]
   \[ \%M_{SP} = \frac{M}{SP} = \frac{50.00}{115.00} = .4347 = 43.5\% \]

7. \[ M = SP - C = 165.99 - 71.25 = 94.74 \]
   \[ \%MC = \frac{M}{C} = \frac{94.74}{71.25} = 1.3296 = 133\% \]
   \[ \%M_{SP} = \frac{M}{SP} = \frac{94.74}{165.99} = .5707 = 57.1\% \]

Chapter 8, Section III

1. Sale price = Original Price – Markdown = 189.95 – 28.50 = $161.45
   \[ MD\% = \frac{MD}{\text{Original price}} = \frac{28.50}{189.95} = \frac{1500}{189.95} = 15\% \]

6. \[ MD = \text{Original price} – \text{Sale price} = 68.00 – 51.99 = 16.01 \]
   \[ MD\% = \frac{MD}{\text{Original price}} = \frac{16.01}{68.00} = \frac{2354}{6800} = 23.5\% \]
Chapter 9, Section I

1. Monthly Salary = \( \frac{15,000}{12} = \$1,250.00 \)
   
   Semimonthly Salary = \( \frac{15,000}{24} = \$625.00 \)
   
   Biweekly Salary = \( \frac{15,000}{26} = \$576.92 \)
   
   Weekly salary = \( \frac{15,000}{52} = \$288.46 \)

4. Annual salary = \( 1,800.00 \times 12 = \$21,600.00 \)

   Semimonthly Salary = \( \frac{21,600}{24} = \$900.00 \)

   Biweekly Salary = \( \frac{21,600}{26} = \$830.77 \)

   Weekly salary = \( \frac{21,600}{52} = \$415.38 \)

13. Total Hours = 7+8+5+8+8 = 36
    Overtime Hours = 0
    Overtime Pay = 0
    Regular Pay = 36 \times \$8.70 = \$313.20
    Total Pay = Regular Pay + Overtime Pay = 313.20 + 0 = \$313.20

18. Total Gross Pay = 50 \times \$3.60 = \$180.00
    = 50 \times \$4.25 = \$212.50
    = 9 \times \$4.50 = \$ 40.50
    = \$433.00

Chapter 9, Section II

1. \( 825 \times .062 = \$51.15 \) Social security
   
   \( 825 \times .0145 = \$11.96 \) Medicare

5. \( 3,422 \times .062 = \$212.16 \) Social security
   
   \( 3,422 \times .0145 = \$49.62 \) Medicare
Chapter 9, Section II (Continued)

9.  
75.00 \times 2 = 150.00  
594.00 - 150.00 = 444.00  
444.00 - 160.00 = 284.00  
\text{Tax} = .10(284.00) = \$28.40

16.  
\text{Gross Earnings} = \$4,633 \text{ Single, Monthly, 3 Allowances}  
\text{At least 4,600 but less than 4,640}  
\text{Combined Withholding} = \$879.43

Chapter 9, Section III

1.  
a.  
570 \times 8 = \$4,560 \text{ Gross earnings per week}  
4,560 \times .062 = \$282.72 \text{ Total social security}  
4,560 \times .0145 = \$66.12 \text{ Total Medicare}

b.  
282.72 \times 13 = \$3,675.36 \text{ Social Security for the first quarter}  
66.12 \times 13 = \$859.56 \text{ Medicare for the first quarter}

4.  
53,200 \times .124 = \$6,596.80 \text{ Social security}  
53,200 \times .029 = \$1,542.80 \text{ Medicare}

7.  
a.  
7,000 \times .054 = \$378 \text{ SUTA annually}  
b.  
7,000 \times .006 = \$42 \text{ FUTA annually}

11.  
a.  
25,200 \times .064 = \$1,612.80  
25,200 \times .058 = 1,461.60  
48 \times 14.50 = 696.00  
\$3,770.40

b.  
\[ R = \frac{P}{B} = \frac{3,770.40}{25,200.00} = .1496 = 15\% \]

c.  
3,770.40 \times 52 = \$196,060.80 \text{ Annual cost of fringe benefits}
Chapter 10, Section I

1. \( I = PRT = 5,000 \times .08 \times 2 = \$800 \)

7. \( I = PRT \)

   Exact: \( 45,000 \times .13 \times \frac{100}{365} = \$1,602.74 \)

   Ordinary: \( 45,000 \times .13 \times \frac{100}{360} = \$1,625.00 \)

17. \( I = PRT = 54,000 \times .119 \times 2 = \$12,852.00 \)

   \( MV = P + I = 54,000 + 12,852 = \$66,852.00 \)

23. \( MV = P(1 + RT) = 1,500(1 + .09 \times 2) = \$1,770.00 \)

29.

\[
\begin{array}{c}
30 \\
5 \\
25 \text{ Sept} \\
61 \text{ Oct-Nov} \\
+ 12 \text{ Dec} \\
98 \text{ Days}
\end{array}
\]

35.

\[
\begin{array}{c}
31 \\
19 \\
12 \text{ Oct} \\
30 \text{ Nov} \\
+ 3 \text{ Dec} \\
45
\end{array}
\]
Chapter 10, Section II

1. \[ P = \frac{I}{RT} = \frac{300}{.12 \times 2} = $1,250.00 \]

8. \[ R = \frac{I}{PT} = \frac{1,200}{5,000 \times 3} = 8\% \]

15. \[ T = \frac{I}{PR} = \frac{948}{18,000 \times .12} = .4388889 \times 360 = 158 \text{ Days} \]

33. \[ I = PRT = 100,000 \times .08 \times \frac{40}{360} = $888.89 \]

$35,000.00 Paid
$3,888.89 Interest
$34,111.11

$100,000.00
$34,111.11

$65,888.89 Adjusted Principal

\[ MV = P(1 + RT) = 65,888.89 \left(1 + .08 \times \frac{50}{360}\right) = $66,620.99 \]

Chapter 10, Section III

1. Bank Discount = \[ FV \times R \times T = 4,500 \times .13 \times \frac{6}{12} = $292.50 \]

Proceeds = \[ FV - \text{Discount} = 4,500 - 292.50 = $4,207.50 \]
Chapter 10, Section III (Continued)

6. Maturity date =
   \[30 - \frac{3}{27}\text{ Days in June}\]
   27 June
   31 July
   \[22\text{ Aug}\] → August 22
   80 Days

   Bank Discount = \(FV \times R \times T\) = \(16,800 \times .10 \times \frac{80}{360} = $373.33\)
   Proceeds = \(FV - \text{Discount}\) = \(16,800.00 - 373.33 = $16,426.67\)

11. Bank Discount = \(FV \times R \times T\) = \(2,700 \times .14 \times \frac{126}{360} = $132.30\)
    Proceeds = \(FV - \text{Discount}\) = \(2,700 - 132.30 = $2,567.70\)

    Effective Rate = \(\frac{\text{Discount}}{P \times T}\) = \(\frac{132.30}{2,567.70 \times \frac{126}{360}} = 14.72\%\)
Chapter 10, Section III (Continued)

16. Maturity date =
   31
   − 4
   27 Days in March

   27 March
   30 April
   13 May → May 13
   70 Days

   \[ MV = FV(1 + RT) = 2,500 \left(1 + .12 \times \frac{70}{360}\right) = 2,558.33 \]

   Discount Period =
   30
   − 15
   15 Days in April

   15 April
   13 May
   28 Days

   Bank Discount = \( FV \times R \times T = 2,558.33 \times .13 \times \frac{28}{360} = 25.87 \)

   Proceeds = \( FV - \text{Discount} = 2,558.33 - 25.87 = 2,532.46 \)

21. Interest = Face Value × Discount Rate × Time = 15,000 × .052 × \( \frac{13}{52} \) = $195.00

   Purchase Price = Face Value – Interest = 15,000 – 195.00 = $14,805.00

   Effective Rate = \( \frac{\text{Interest}}{\text{Purchase price} \times \text{Time}} = \frac{195}{14,805.00 \times \frac{13}{52}} = 0.05268 = 5.27\% \)
Chapter 11, Section I

1. Periods = Years × Periods/Year = 3 × 1 = 3

   Rate per period = \[ \text{Nominal Rate} \over \text{Periods/Year} \] = \[ 13 \over 1 \] = 13%

8. 4,000 Original Principal
   + 400 Interest Period 1 \( I = PRT = 4,000 \times .1 \times 1 = 400 \)
   4,400 Principal period 2
   + 440 Interest period 2 \( I = PRT = 4,400 \times .1 \times 1 = 440 \)
   $4,840 Compound amount

   Compound Interest = Compound amount – Principal
                    = $4,840 – 4,000
                    = $840

12. 13%, 4 Periods
    Compound Amount = Table factor × Principal
                     \[ 1.63047 \times 7,000 = 11,413.29 \]

    Compound interest = Compound amount – Principal
                       \[ 11,413.29 – 7,000.00 = 4,413.29 \]

19. Table factor required = 1%, 36 Periods
    1%, 18 Periods: \[ 1.19615 \]
    1%, 18 Periods × 1.19615
    36 Periods \[ 1.4307748 = 1.43077 \] “New” factor 1%, 36 Periods

    Compound Amount = Table factor × Principal
                     \[ 1.43077 \times 13,000 = 18,600.01 \]

24. 5%, 2 Periods

    Compound amount = Table factor × Principal
                     \[ 1.10250 \times 5,000 = 5,512.50 \]

    Compound interest = Compound amount – Principal
                        \[ 5,512.50 – 5,000 = 512.50 \]

    Annual Percentage Yield (APY) = \[ \frac{\text{1 year interest}}{\text{Principal}} \] = \[ \frac{512.50}{5,000.00} \] = 10.25%
Chapter 11, Section I (Continued)

35. \( i = \frac{4.2\%}{2} = 2.1\% = .021, \ n = 4 \times 2 = 8 \)

\[
A = P(1 + i)^n
\]

\[
A = 5,000(1 + .021)^8 = 5,904.40
\]

Compound Interest = Compound amount – Principal
Compound interest = 5,904.40 – 5,000.00 = 904.40

Chapter 11, Section II

1. 9%, 3 Periods
Present value = Table factor \times\ Compound amount

\[
.77218 \times 6,000 = 4,633.08
\]

Compound interest = Compound amount – Present value
6,000.00 – 4,633.08 = 1,366.92

11. Table factor required = 4%, 40 Periods
4%, 20 Periods: .45639
4%, 20 Periods \times .45639
40 Periods .2082918 = .20829 “New” factor 4%, 40 Periods

Present Value = Table factor \times\ Compound amount

\[
.20829 \times 12,000 = 2,499.48
\]

23. \( i = \frac{3.8\%}{1} = 3.8\% = .038, \ n = 7 \times 1 = 7 \)

\[
PV = \frac{A}{(1+i)^n}
\]

\[
PV = \frac{4,500}{(1+.038)^7} = 3,466.02
\]

Compound interest = Compound amount – Present value
4,500.00 – 3,466.02 = 1,033.98
Chapter 12, Section I

1. \( R = 2\% \quad P = 16 \quad F = 18.63929 \)
   Future value = \( 1,000 \times 18.63929 = \$18,639.29 \)

6. \( R = 5\% \quad P = 24 + 1 = 25 \quad F = 47.72710 - 1.00000 = 46.72710 \)
   Future value = \( 400 \times 46.72710 = \$18,690.84 \)

16. \( FV = PMT \times \left( \frac{(1+i)^n - 1}{i} \right) \)
   \( i = \frac{3\%}{2} = 1.5\% = .015, \quad n = 3 \times 2 = 6 \)
   \( FV = 2,000 \times \left( \frac{(1+.015)^6 - 1}{.015} \right) = \$12,459.10 \)

19. \( FV = PMT \times \left( \frac{(1+i)^n - 1}{i} \right) \times (1+i) \)
   \( i = \frac{1.5\%}{12} = .125\% = .00125, \quad n = 5 \times 12 = 60 \)
   \( FV = 675 \times \left( \frac{(1+.00125)^{60} - 1}{.00125} \right) \times (1+.00125) = \$42,082.72 \)

Chapter 12, Section II

1. \( R = 5\% \quad P = 14 \quad F = 9.89864 \)
   Amount = \( 300.00 \times 9.89864 = \$2,969.59 \)

6. \( R = 11\% \quad P = 9 \quad F = 5.53705 + 1.00000 \)
   Amount = \( 1,400.00 \times 6.53705 = \$9,151.87 \)

17. \( PV = PMT \times \frac{1-(1+i)^{-n}}{i} \)
   \( i = \frac{6\%}{4} = 1.5\% = .015, \quad n = 3.25 \times 4 = 13 \)
   \( PV = 500 \times \frac{1-(1+.015)^{-13}}{.015} = \$5,865.77 \)
Chapter 12, Section II (Continued)

20. \( PV = PMT \times \frac{1 - (1 + i)^{-n}}{i} \times (1 + i) \)

\( i = \frac{5.8\%}{1} = 5.8\% = .058, \; n = 5 \times 1 = 5 \)

\( PV = 1,100 \times \frac{1 - (1 + .058)^{-5}}{.058} \times (1 + .058) = \$4,929.14 \)

Chapter 12, Section III

1. \( R = 5\% \quad P = 16 \quad FV = 50,000.00 \quad \text{Table factor} = 23.65749 \)

Payment = \( \frac{50,000.00}{23.65749} = \$2,113.50 \)

6. \( R = 9\% \quad P = 12 \quad PV = 30,000.00 \quad \text{Table factor} = 7.16073 \)

Payment = \( \frac{30,000.00}{7.16073} = \$4,189.52 \)

16. \( PMT = FV \times \frac{i}{(1+i)^n - 1} \)

\( i = \frac{6\%}{4} = 1.50\% = .0150, \; n = 5 \times 4 = 20 \)

\( PMT = 8,000 \times \frac{.0150}{(1+.0150)^{20} - 1} = \$345.97 \)

19. \( PMT = PV \times \frac{i}{1 - (1+i)^{-n}} \)

\( i = \frac{10.6\%}{1} = 10.6\% = .106, \; n = 10 \times 1 = 10 \)

\( PMT = 22,500 \times \frac{.106}{1 - (1+.106)^{-10}} = \$3,756.68 \)
Chapter 13, Section I

1. Periodic rate = \(\frac{\text{Annual percentage rate}}{12}\) = \(\frac{18}{12}\) = 1.5\%

Finance charge = Previous month’s balance \(\times\) Periodic rate = 167.88 \(\times\) .015 = $2.52

New balance = Previous balance + Finance charge + Purchases & cash advances – Payments & credits

New balance = 167.88 + 2.52 + 215.50 – 50.00 = $335.90

13.

<table>
<thead>
<tr>
<th>Date</th>
<th>Activity</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>November 6</td>
<td>Purchase</td>
<td>$83.20</td>
</tr>
<tr>
<td>November 13</td>
<td>Payment</td>
<td>$150.00</td>
</tr>
<tr>
<td>November 19</td>
<td>Purchase</td>
<td>$348.50</td>
</tr>
<tr>
<td>November 24</td>
<td>Credit</td>
<td>$75.25</td>
</tr>
<tr>
<td>November 27</td>
<td>Cash advance</td>
<td>$200.00</td>
</tr>
</tbody>
</table>

Average daily balance = \(\frac{20,335.25}{30}\) = $677.84

17. 7\% + 5.4\% = 12.4\%

Chapter 13, Section II

1. Amount financed = Purchase price – Down payment = 1,400.00 – 350.00 = $1,050.00

Finance charge = Total amount of installment payments – Amount financed

\(= (24 \times 68.00) – 1,050.00\)
\(= 1,632.00 – 1,050.00 = \$582.00\)

Total deferred payment price = Total of installment payments + Down payment

\(= 1,632.00 + 350.00 = \$1,982.00\)

8. Amount financed = Purchase price(100\% – Down payment percent) = 788.00 \(\times\) .9 = $709.20

\(I(\text{finance charge}) = P(\text{amount financed}) \times R \times T\)
\(= 709.20 \times .08 \times 1 = \$56.74\)

Monthly Payment = \(\frac{\text{Amount financed} + \text{Finance charge}}{\text{Number of payments}}\)
\(= \frac{709.20 + 56.74}{12} = \$63.83\)
Chapter 13, Section II (Continued)

15. Finance charge = Total amount of installment payments – Amount financed
   \[= (24 \times 109.25) - 2,300.00\]
   \[= 2,622.00 - 2,300.00 = \$322.00\]
   Finance charge per $100 = \frac{\text{Finance charge} \times 100}{\text{Amount financed}} = \frac{322 \times 100}{2,300} = \$14.00
   APR by table = 24 payments, $14.00 finance charge per $100 = 13%

21. Finance charge = Total amount of installment payments – Amount financed
   \[= (12 \times 44.25) - 500.00\]
   \[= 531.00 - 500.00 = \$31.00\]
   APR = \frac{72I}{3P(n+1)+I(n-1)} = \frac{72(31)}{3(500)(12+1)+31(12-1)} = 11.25%

27. APR = 13.5%, 48 payments, table factor = \$29.97
   Finance charge = \frac{\text{Amount financed} \times \text{table factor}}{100} = \frac{5,000 \times 29.97}{100} = \$1,498.50
   Monthly Payment = \frac{\text{Amount financed} + \text{Finance charge}}{\text{Number of months of the loan}} = \frac{5,000.00 + 1,498.50}{48} = \$135.39

33. Payments remaining = Number of payments – Number of payments made = 12 – 4 = 8
   Sum of the digits = \frac{n(n+1)}{2}
   Sum of the digits, remaining payments = \frac{8(8+1)}{2} = 36
   Sum of the digits, total number of payments = \frac{12(12+1)}{2} = 78
   Rebate fraction = \frac{36}{78}
Chapter 13, Section II (Continued)

39. Payments remaining = Number of payments – Number of payments made = 24 – 9 = 15
Sum of the digits = \( \frac{n(n + 1)}{2} \)

Sum of the digits, remaining payments = \( \frac{15(15 + 1)}{2} = 120 \)

Sum of the digits, total number of payments = \( \frac{24(24 + 1)}{2} = 300 \)

Rebate fraction = \( \frac{120}{300} \)

Finance charge = Total amount of installment payments – Amount financed
= \((24 \times 162.50) – 3,000.00\)
= 3,900.00 – 3,000.00 = $900.00

Finance charge rebate = Rebate fraction \times Total finance charge = \( \frac{120}{300} \times 900 = $360.00 \)

Loan payoff = Payment remaining \times Payments amount – Finance charge rebate
= 15 \times 162.50 – 360.00 = $2,077.50
Chapter 14, Section I

1. Number of $1,000’s financed = \frac{\text{Amount financed}}{1,000} = \frac{80,000}{1,000} = 80

Table factor for 9%, 20 years is 9.00

Monthly payment = Number of $1,000’s financed \times \text{Table factor}
= 80 \times 9.00 = $720.00

Total interest = (Monthly payment \times \text{Number of payments}) - \text{amount financed}
= (720.00 \times 240) - 80,000 = $92,800.00

9. \frac{76,400.00}{1,000} = 76.4
8\% \text{ for } 20 \text{ years} = 8.37 \times 76.4
Monthly PI = $639.47

Annual Insurance = 866.00
Annual Taxes = 1,317.00
Annual TI = 2,183.00 + 12 = 181.92
+ 639.47
Monthly PITI = $821.39

19. a. What is the calculated interest rate of the ARM?

Calculated ARM interest rate = Index rate + Lender’s margin
Calculated ARM interest rate = 3.25 + 4.1 = 7.35%

b. What is the maximum overall rate of the loan?

Maximum overall ARM rate = Initial rate + Overall rate cap
Maximum overall ARM rate = 7.35 + 5.0 = 12.35%

Chapter 14, Section II

1. Percentage of appraised value = \text{Appraised value} \times \text{Lender’s percentage}
= .75 \times 118,700 = $89,025

Potential credit = Percentage of appraised value – First mortgage balance
= 89,025 – 67,900 = $21,125
Chapter 14, Section II (Continued)

8. Housing expense ratio = \( \frac{\text{Monthly housing expense (PITI)}}{\text{Monthly gross income}} \) = \( \frac{455}{2,000} \) = 22.75

Total obligations ratio = \( \frac{\text{Total monthly financial obligations}}{\text{Monthly gross income}} \) = \( \frac{455 + 380}{2,000} \) = 41.75

16. \( 324,600 \times .75 = 243,450 \)
\( - 145,920 \)
Available credit $97,530
Contemporary Mathematics for Business and Consumers, 7e  
Solutions to Jump Start Section Review Exercises

Chapter 15, Section I

1. Owner’s Equity = Assets – Liabilities = 283,000 – 121,400 = **$161,600**  
2. Assets = Liabilities + Owner’s Equity = 335,900 + 213,000 = **$548,900**  
3. Liabilities = Assets – Owner’s Equity = 45,300 – 16,300 = **$29,000**

Chapter 15, Section II

1. Net sales = Cost of Goods Sold + Gross Margin = 244,600 + 321,100 = **$565,700**  
   Net profit = Net sales – Total Expenses = 565,700 – 521,000 = **$44,700**  
2. Cost of Goods Sold = Net Sales – Gross Margin = 4,232,000 – 1,870,000 = **$2,362,000**  
   Operating Expenses = Gross Margin – Net Profit = 1,870,000 – 659,500 = **$1,210,500**  
   Net profit = Net sales – Total Expenses = 705,300 – 594,975 = **$110,325**

Chapter 15, Section III

1. Working capital = Current assets – Current liabilities = 450,000 – 132,000 = **$318,000**
   
   Current ratio = \(\frac{\text{Current assets}}{\text{Current liabilities}} = \frac{450,000}{132,000} = 3.41:1\)
   
6. Quick Assets = Cash + Marketable Securities + Receivables = 39,350 + 95,000 + 52,770 = **$187,120**
   
   Acid test ratio = \(\frac{\text{Cash + securities + receivable}}{\text{Current liabilities}} = \frac{187,120}{132,000} = 1.42:1\)
   
11. Average collection period = \(\frac{\text{Accounts receivable} \times 365}{\text{Credit sales}}\)
    
    Average collection period = \(\frac{52,770 \times 365}{770,442} = \frac{19,261,050}{770,442} = 25 \text{ days}\)
   
14. Average Inventory = \(\frac{\text{Beginning Inventory} + \text{Ending Inventory}}{2}\)
    
    Average Inventory = \(\frac{1,547,800 + 1,366,000}{2} = \frac{2,913,800}{2} = \$1,456,900\)
    
    Inventory Turnover = \(\frac{\text{Cost of Goods Sold}}{\text{Average Inventory}}\)
    
    Inventory Turnover = \(\frac{6,500,000}{1,456,900} = 4.5\)
Chapter 15, Section III (Continued)

19. Asset turnover ratio = \( \frac{\text{Net sales}}{\text{Total assets}} = \frac{650,000}{2,450,000} = 0.27 = 0.27:1 \)

21. Owner’s Equity = Assets – Liabilities = 1,400,000 – 535,000 = $865,000

Debt-to-assets ratio = \( \frac{\text{Total liabilities}}{\text{Total assets}} = \frac{535,000}{1,400,000} = .38 : 1 \)

Debt-to-equity ratio = \( \frac{\text{Total liabilities}}{\text{Stockholders’ equity}} = \frac{535,000}{865,000} = .62 : 1 \)

25. Gross Profit = Net Sales – Cost of Goods Sold = 640,000 – 414,000 = $226,000

Net profit = Net sales – Total Expenses = 640,000 – 526,600 = $113,400

Gross Profit Margin = \( \frac{\text{Gross Profit}}{\text{Net Sales}} = \frac{226,000}{640,000} = 35.3\% \)

Net Profit Margin = \( \frac{\text{Net Income}}{\text{Net Sales}} = \frac{113,400}{640,000} = 17.7\% \)

29. Return on investment = \( \frac{\text{Net income}}{\text{Shareholders’ equity}} = \frac{113,400}{525,000} = 21.6\% \)
## Chapter 16, Section I

### Superior Electronics

**Sonic Blu-ray Player Inventory**

<table>
<thead>
<tr>
<th>Date</th>
<th>Units Purchased</th>
<th>Cost per Unit</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginning Inventory, Jan 1</td>
<td>40</td>
<td>$125</td>
<td>$5,000</td>
</tr>
<tr>
<td>Purchase, February 20</td>
<td>32</td>
<td>118</td>
<td>3,776</td>
</tr>
<tr>
<td>Purchase, April 16</td>
<td>30</td>
<td>146</td>
<td>4,380</td>
</tr>
<tr>
<td>Purchase, June 8</td>
<td>25</td>
<td>135</td>
<td>3,375</td>
</tr>
</tbody>
</table>

**Blu-ray Players Available for Sale:** 127  
**Cost of Goods Available for Sale:** $16,531

2.

a. Calculate the dollar value of the 64 Blu-ray players by using FIFO?

<table>
<thead>
<tr>
<th>Units</th>
<th>Cost/Unit</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>$135</td>
<td>$3,375</td>
</tr>
<tr>
<td>30</td>
<td>146</td>
<td>4,380</td>
</tr>
<tr>
<td>9</td>
<td>118</td>
<td>1,062</td>
</tr>
<tr>
<td><strong>64</strong></td>
<td><strong>$8,817</strong></td>
<td><strong>FIFO</strong></td>
</tr>
</tbody>
</table>

b. Calculate the dollar value of the 64 Blu-ray players by using LIFO?

<table>
<thead>
<tr>
<th>Units</th>
<th>Cost/Unit</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>$125</td>
<td>$5,000</td>
</tr>
<tr>
<td>24</td>
<td>118</td>
<td>2,832</td>
</tr>
<tr>
<td><strong>64</strong></td>
<td><strong>$7,832</strong></td>
<td><strong>LIFO</strong></td>
</tr>
</tbody>
</table>

c. Calculate the dollar value of the 64 Blu-ray players by using the average cost method?

\[
\text{Average cost} = \frac{16,531}{127} = 130.165 = $130.17 \text{ Each}
\]

\[
\text{Inventory value} = 64 \times 130.17 = $8,330.88
\]
Chapter 16, Section I (Continued)

7. A Nose for Clothes Boutique

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity</th>
<th>Unit Price</th>
<th>Valuation Basis</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Cost</td>
<td>Market</td>
<td></td>
</tr>
<tr>
<td>Jackets</td>
<td>56</td>
<td>$124</td>
<td>$128</td>
<td>Cost</td>
</tr>
<tr>
<td>Slacks</td>
<td>88</td>
<td>58</td>
<td>53</td>
<td>Market</td>
</tr>
<tr>
<td>Belts</td>
<td>162</td>
<td>19</td>
<td>17</td>
<td>Market</td>
</tr>
<tr>
<td>Blouses</td>
<td>125</td>
<td>41</td>
<td>45</td>
<td>Cost</td>
</tr>
</tbody>
</table>

Total Value of Inventory $19,487

Chapter 16, Section II

1. Perfume Bazaar
Financial Highlights
June 1 – June 30

<table>
<thead>
<tr>
<th></th>
<th>Cost</th>
<th>Retail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginning inventory, June 1</td>
<td>$43,000</td>
<td>$92,000</td>
</tr>
<tr>
<td>Net purchases (June)</td>
<td>26,000</td>
<td>55,300</td>
</tr>
<tr>
<td>Net sales (June)</td>
<td>$132,400</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Cost</th>
<th>Retail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginning inventory, June 1</td>
<td>43,000</td>
<td>92,000</td>
</tr>
<tr>
<td>Net purchases (June)</td>
<td>26,000</td>
<td>55,300</td>
</tr>
<tr>
<td>Goods available for sale</td>
<td>$69,000</td>
<td>$147,300</td>
</tr>
</tbody>
</table>

Goods available for sale at retail = 147,300
Net sales = −132,400
Ending inventory at retail = $14,900

Cost ratio = \(\frac{69,000}{147,300} = 0.468 = 47\%\)
Chapter 16, Section II (Continued)

4.

Beginning inventory 178,400  
Net purchases + 91,200  
Goods available for sale 269,600

Estimated cost of goods sold = 215,800(100% − 40%) 
= 215,800 × .6 = $129,480

Beginning Inventory + Ending Inventory =  
50,000 + 70,000 = $60,000

Inventory turnover =  
Net Sales = 500,000  
Average Inventory = 60,000 = 8.3

Target Average Inventory =  
Net Sales = 500,000  
Published Turnover = 10.0 = $50,000.00

Chapter 16, Section III

1. Average inventory = \( \frac{\text{Beginning Inventory} + \text{Ending Inventory}}{2} \) = \( \frac{50,000 + 70,000}{2} \) = $60,000

\[
\text{Inventory turnover} = \frac{\text{Net Sales}}{\text{Average Inventory}} = \frac{500,000}{60,000} = 8.3
\]

\[
\text{Target Average Inventory} = \frac{\text{Net Sales}}{\text{Published Turnover}} = \frac{500,000}{10.0} = $50,000.00
\]

2. Average inventory = \( \frac{\text{Beginning Inventory} + \text{Ending Inventory}}{2} \) = \( \frac{48,000 + 56,000}{2} \) = $52,000

\[
\text{Inventory turnover} = \frac{\text{Cost of Goods Sold}}{\text{Average Inventory}} = \frac{335,000}{52,000} = 6.4
\]

\[
\text{Target Average Inventory} = \frac{\text{Cost of Goods Sold}}{\text{Published Turnover}} = \frac{335,000}{6.0} = \text{Above}
\]
Chapter 17, Section I

1. Total Cost = Cost + Shipping charges + Setup expenses = 45,000 + 150 + 500 = $45,650

Total depreciation = Total cost – Salvage value = 45,650 – 3,500 = $42,150

Annual depreciation = \[
\frac{\text{Total depreciation}}{\text{Estimate useful life (years)}} = \frac{42,150}{10} = $4,215
\]

11. Sum-of-the-years-digits = \[
\frac{n(n+1)}{2} = \frac{5(5+1)}{2} = 15
\]

SYD depreciation rate fraction = \[
\frac{\text{Years of useful life remaining}}{\frac{n(n+1)}{2}}
\]

Year 1 = \[
\frac{5}{15}
\]

Year 3 = \[
\frac{3}{15}
\]

Year 5 = \[
\frac{1}{15}
\]

18. Straight-Line rate = \[
\frac{1}{6} = 16.67\%
\]

Declining balance rate = \[
\frac{1}{\text{Useful life}} \times \text{Multiple} = \frac{1}{6} \times 2 = 33.34\%
\]

25. Depreciation per unit = \[
\frac{\text{Cost} – \text{Salvage value}}{\text{Units of useful life}} = \frac{15,000 – 2,800}{100,000} = $0.122
\]
Chapter 17, Section II

1. a. What was the basis for depreciation for the printing press?
   
   Business-use basis = 660,000 × .9 = $594,000
   
   Tentative basis = 594,000 − 100,000 = $494,000
   
   The asset qualifies for a 50% special depreciation allowance (Table 17-4)
   
   Basis for depreciation = 494,000 (100% − 50%) = $247,000
   
   b. What was the amount of the third year’s depreciation using MACRS?
   
   Printing presses are in the 7-year property class (Table 17-1)
   
   Third year depreciation = 17.49% (Table 17-2)
   
   247,000 × .1749 = $43,200.30

6. a. What is the average depletion cost per ounce?

   Total depreciation = 49,250,000 + 7,462,500 − 5,300,000 = $51,412,500
   
   Average depletion cost per ounce = \( \frac{51,412,500}{225,000} = \$228.50 \)
   
   b. If 16,200 ounces were mined in the first year of operation, what is the amount of the depletion cost?

   First year depletion cost = 16,200 × 228.50 = $3,701,700
Chapter 18, Section I

1. $8.95 from table, tax = 0.59

   Total Purchase price = Selling price + Sales tax = 8.95 + 0.59 = $9.54

7. Sales tax = Selling price × Sales tax rate = 1,440.00 × .07 = $100.80

   Excise tax = Selling price × Excise tax rate = 1,440.00 × .03 = $43.20

   Total purchase price = Selling price + Sales tax + Excise tax = 1,440.00 + 100.80 + 43.20 = $1,584.00

Chapter 18, Section II

1. Assessed value = FMV × Assessment rate = 240,000 × .9 = $216,000

   Property tax due = Assessed value × Tax rate = 216,000 × .041 = $8,856.00

2. Assessed value = FMV × Assessment rate = 95,500 × .75 = $71,625

   Property tax due = Assessed value × Tax rate = 71,625 × \( \frac{1.80}{100} \) = $1,289.25

3. Assessed value = FMV × Assessment rate = 310,000 × 1 = $310,000

   Property tax due = Assessed value × Tax rate = 310,000 × \( \frac{17.25}{1,000} \) = $5,347.50

4. Assessed value = FMV × Assessment rate = 194,460 × .80 = $155,568

   Property tax due = Assessed value × Tax rate = 155,568 × \( \frac{35.5}{1,000} \) = $5,522.66

13. Tax rate per dollar = \( \frac{\text{Total tax required}}{\text{Total assessed property value}} \) = \( \frac{39,450,000}{850,000,000} \) = .046412 = 4.65%

   (Note: In most states, rounding is always up, even if the next digit is less than 5.)

   Per $100 = .0465 × 100 = $4.65

   Per $1,000 = .0465 × 1,000 = $46.50

   In mills = \( \frac{.0465}{.001} \) = 46.5
Chapter 18, Section III

1. AGI = Income − Adjustments = 34,300 − 2,120 = $32,180

   Standard deduction is higher than itemized deductions = $5,950

   Exemption allowances = 1 × 3,800 = $3,800

   Taxable Income = AGI − Deductions − Allowances = 32,180 − 5,950 − 3,800 = $22,430

10. Single, taxable income = $62,340 Tax Table Exhibit 18-3, 62,300-62,350 = $11,611

15. Tax Computation Worksheet, Exhibit 18-4 Section D 175,800.00 × .28 − 9,024.00 = $40,200.00

20. Refund(Owe) = Payments + Credits − Tax Liability − Other Taxes
   = 5,300 + 1,670 − 7,525 − 840 = (1,395) = Owe $1,395

26. Taxable income = 352,100

   Corporate Tax Rate Schedule, Exhibit 18-6, Over 335,000 But not over 10,000,000

   Tax is $113,900 + 34% of the amount over 335,000

   352,100 − 335,000 = 17,100

   Tax Liability = 113,900 + .34(17,100) = $119,714.00

   Net Income after Taxes = Taxable Income − Tax Liability = 352,100 − 119,714 = $232,386.00
Chapter 19, Section I

1. Face value = $5,000  Male—24

   Number of 1,000s = \( \frac{5,000}{1,000} = 5 \)

   Whole life annual premium = \( 15.90 \times 5 = $79.50 \)

   Semiannual premium = \( 79.50 \times .52 = $41.34 \)

   Quarterly premium = \( 79.50 \times .26 = $20.67 \)

   Monthly premium = \( 79.50 \times .09 = $7.16 \)

9. Nonforfeiture options: Face value = $50,000, 10 years in force, Whole life

   Number of 1,000s = \( \frac{50,000}{1,000} = 50 \)

   Option 1, Cash value = $98.00 per 1,000 = \( 98.00 \times 50 = $4,900.00 \)

   Option 2, Reduced, Paid up = $186.00 per 1,000 = \( 186.00 \times 50 = $9,300.00 \) Insurance for life

   Option 3, Extended term = 17 years, 54 days

18. Total living expenses = $39,800

   Total income = \( 23,000 + 4,000 = $27,000 \)

   Income shortfall = \( 39,800 - 27,000 = $12,800 \)

   \[
   \frac{\text{Income shortfall}}{\text{Prevailing interest rate}} = \frac{12,800}{.025} = $512,000 \text{ Insurance needed}
   \]
Chapter 19, Section II

1. Building value = $425,000, Contents value = $70,000, Area 5, Class D

   Building, number of 100s = \( \frac{425,000}{100} = 4,250 \)

   Contents, number of 100s = \( \frac{70,000}{100} = 700 \)

   Building = \( 1.39 \times 4,250 = 5,907.50 \)

   Contents = \( 1.43 \times 700 = 1,001.00 \)

   Total Annual Premium = 5,907.50 + 1,001.00 = $6,908.50

7. Annual premium $750 canceled by insured after 2 months

   Premium = \( 750 \times 0.30 = 225.00 \)

   Refund = \( 750 - 225 = 525.00 \)

8. Annual premium $390 canceled by insurance company after 5 months

   Premium = \( 390 \times \frac{5}{12} = 162.50 \)

   Refund = \( 390.00 - 162.50 = 227.50 \)

14. Replacement cost = $430,000, Face value = $225,000, Coinsurance = 70%, Loss = $150,000

   Insurance required = \( 430,000 \times 0.70 = 301,000 \)

   Amount of loss paid by insurance = \( \frac{\text{Insurance carried}}{\text{Insurance required}} \times \text{Amount of the loss} \)

   = \( \frac{225,000}{301,000} \times 150,000 = \$112,126.25 \)
Chapter 19, Section III

1. Territory 2, Driver Class 4

   Bodily Injury 50/100 = $109.00

   Property Damage 25 = $ 73.00

   Model class J, Vehicle age 3

   Comprehensive Deductible $100 = $ 68.00

   Collision Deductible $250 = $ 93.00

   Rating Factor None

   Annual Premium = 109 + 73 + 68 + 93 = $343.00
Chapter 20, Section I

1. Preferred Stock dividends = 100 × .03 = $3 + 1 year arrears = $6

Common share dividends = Dividend declared – Preferred stock dividend ÷ Common Stock shares
= 8,000,000 – (6.00 × 1,000,000) ÷ 4,000,000 = $0.50

7. From Stock Quotation Table, Exhibit 20-3 Wal-Mart Stores, Inc.

Symbol = WMT

Open Price = $51.02

Percent Change = up .06%

13. Current yield = \( \frac{\text{Annual dividend}}{\text{Current price}} \)

\( \frac{.55}{32.70} = 1.7\% \)

Price-Earnings Ratio = \( \frac{\text{Current price per share}}{\text{Earnings per share}} \)

\( \frac{32.70}{2.18} = 15 \)

19. Cost of shares = Price per share × Number of shares = 19.60 × 200 = $3,920.00

Broker’s Commission = Cost of shares × Commission rate = 3,920.00 × .01 = $39.20

Total cost = Cost of shares + Broker’s commission = 3,920.00 + 39.20 = $3,959.20

Value of shares = Price per share × Number of shares = 24.80 × 200 = $4,960.00

Broker’s Commission = Cost of shares × Commission rate = 4,960.00 × .01 = $49.60

Proceeds = Value of shares – Broker’s commission = 4,960.00 – 49.60 = $4,910.40

Gain or (loss) on transaction = Proceeds – Total cost = 4,910.40 – 3,959.20 = $951.20
Chapter 20, Section II

1. From Corporate Bond Quotation Table, Exhibit 20-5 Ford Motor Credit (F.GSQ)
   
   Coupon = \(8.000\%\)
   
   High = 107.250

11. Accrued interest = \(1,000 \times 0.055 \times \frac{2}{12} = 9.17\)

   Price per bond = Current market price + Accrued interest + Commission
   
   = 862.50 + 9.17 + 5.00 = $876.67

   Total purchase price = Price per bond × Number of bonds = 876.67 × 1 = $876.67

16. Accrued interest = \(1,000 \times 0.0625 \times \frac{21}{360} = 3.65\)

   Proceeds per bond = Current market price + Accrued interest – Commission
   
   = 915.00 + 3.65 – 6.00 = $912.65

   Total proceeds = Proceeds per bond × Number of bonds sold = 912.65 × 10 = $9,126.50

21. Annual interest = Par value × Coupon rate = 1,000 × 0.06625 = $66.25

   Current yield = \(\frac{Annual\ interest}{Current\ market\ price}\) = \(\frac{66.25}{91.125}\) = 7.3%
Chapter 20, Section III

1. From Mutual Fund Quotation Table, Exhibit 20-6, PIMCO Fds Institutional, AllAsset
   Symbol = PAAIX
   Net asset value = $12.30

11. Mutual fund sales charge = Offer Price – Net asset value = 18.25 – 17.58 = $0.67
   Sales charge % = \frac{Sales\ charge}{Net\ asset\ value} = \frac{0.67}{17.58} = 3.8\%

16. Net asset value = \frac{Total\ assets - Total\ Liabilities}{Number\ of\ shares\ outstanding} = \frac{25,000,000 - 6,300,000}{2,000,000} = $9.35
   Shares purchased = \frac{Total\ investment}{Offer\ price} = \frac{8,000}{9.92} = 806.452

21. Total cost of purchase = 300 \times 12.50 = $3,750.00
   Proceeds on sale = 300 \times 14.20 = $4,260.00
   Total gain or (loss) = 4,260.00 - 3,750.00 + (300 \times .25) = $585.00
   Return on Investment = \frac{Total\ gain\ (loss)}{Total\ cost\ of\ purchase} = \frac{585.00}{3,750.00} = 15.6\%
Chapter 21, Section I

1. From the line chart “Widget Sales 2007-2014”
   a. 2007 widget sales = $0.2 billion
   b. Year widget sales reach $0.8 billion = 2012

Chapter 21, Section II

1. \[
\frac{5 + 7 + 21 + 46 + 35 + 2 + 19 + 7}{8} = \frac{142}{8} = 17.8
\]

5. 3 4 5 8(9) 12 16 18 30
The median is 9

6. 28 34 (48) 55 56 60
\[
\frac{48 + 55}{2} = \frac{103}{2} = 51.5
\]

10. \(8 \times 2\) (3 \times 3) 5 \times 1 6 \times 2 7 \times 1 (2 \times 3) 1 \times 1 4 \times 1
Both 3 and 2 are modes in this set.

14. Highest = 359
Lowest = 36
Range = 323
Chapter 21, Section III

1. You are the vice president in charge of production for Endeavor Marine, Inc., a manufacturer of custom fishing boats. The following figures represent the number of boats manufactured during each of the past 18 months.

12 15 24 18 22 16 21 19 10 14 26 23 17 15 21 9 28 13

a. Group the data into five classes of equal size (5–9, 10–14, 15–19, 20–24, and 25–29) and construct a frequency distribution of the number of boats.

<table>
<thead>
<tr>
<th>Class</th>
<th>Tally</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>5–9</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>10–14</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>15–19</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>20–24</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>25–29</td>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>

b. Calculate the mean of the grouped data by using 7, 12, 17, 22, and 27 as the midpoints. Round the mean to the nearest tenth if necessary.

<table>
<thead>
<tr>
<th>Class</th>
<th>Tally</th>
<th>Frequency</th>
<th>Midpoint (m)</th>
<th>(f \times m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5–9</td>
<td></td>
<td>1</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>10–14</td>
<td></td>
<td>4</td>
<td>12</td>
<td>48</td>
</tr>
<tr>
<td>15–19</td>
<td></td>
<td>6</td>
<td>17</td>
<td>102</td>
</tr>
<tr>
<td>20–24</td>
<td></td>
<td>5</td>
<td>22</td>
<td>110</td>
</tr>
<tr>
<td>25–29</td>
<td></td>
<td>2</td>
<td>27</td>
<td>(\frac{54}{18})</td>
</tr>
</tbody>
</table>

Mean = \(\frac{321}{18} = 17.8\)

c. Construct a histogram of these data to graphically illustrate your company’s boat manufacturing figures.